MIS  
(Management Information System)  
Sharif University of Technology  
Session # 3

Session schedule

- Contents
  - Systems Analysis and Design
Information system development

- Information system development project
  - Realistic behavior

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System Development Life Cycle (SDLC)

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<td>Internet/Intranet—Web-based transaction processing, media, and graphics</td>
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<td>Object orientation—selection of objects and classes</td>
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<td>CASE—automation and productivity of tier 2</td>
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<td>Structured Tools—DFD, PFD, ERD, STD, process specification, data repository</td>
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Information system development

- System Development Life Cycle (SDLC)
  - The basis for most systems analysis and design methodologies is the system development life cycle or SDLC.
  - It is sometimes called the waterfall method because the model visually suggests work cascading from step to step like a series of waterfalls.
  - In reality, there is considerable feedback between the various steps or phases.

SDLC
- Problem Definition
- Analysis
- Design
- Development
- Testing
- Implementation
- Maintenance
Information system development

- Information system development Methodologies
  - Several models exist to streamline the development process.
  - Sometimes a combination of the models may be more suitable.
  - Waterfall model
  - Unified software development Process model
  - Spiral model
  - Agile development
  - Rapid application development

- Information system development Methodologies
  - Waterfall model
    - The waterfall model is a sequential design process
      1. Requirements specification
  2. Design
  3. Construction (implementation or coding)
  4. Integration
  5. Testing and debugging
  6. Installation
  7. Maintenance
Information system development

- Information system development Methodologies
  - Waterfall model
    - The waterfall model maintains that one should move to a phase only when its preceding phase is completed and perfected.

  - Time spent early on making sure requirements and design are correct saves much time and effort later

  - Waterfall model places emphasis on documentation (such as requirements documents and design documents) as well as source code.

  - Waterfall model is a simple approach and is more disciplined.

- Waterfall model is a bad idea in practice

  - It is impossible to finish a phase of a software product's lifecycle perfectly before moving to the next phases and learning from them

  - Many of the system's details only become known to us as we progress in the system's implementation.

  - Some of the things that we learn invalidate our design and we must backtrack
Information system development

- Information system development Methodologies
  - SSADM
    (Structured systems analysis and design method)
    SSADM techniques
  - The three most important techniques:
    - Logical data modeling
    - Data Flow Modeling
    - Entity Event Modeling

![Structured Systems Analysis and Design Method (SSADM)](image)

Information system development

- Information system development Methodologies
  - USDP model
    - The USDP is a popular iterative and incremental software development process framework.
Information system development

- Information system development Methodologies
  - USDP model
    - Iterative and Incremental
    - Use Case Driven
    - Architecture Centric
    - Risk Focused

- Information system development Methodologies
  - RUP (Rational Unified Process) is a specific implementation of the USDP.
  - RUP is based on a set of building blocks, or content elements, describing
    - what is to be produced,
    - the necessary skills required
    - and the step-by-step explanation describing how specific development goals are to be achieved.

- The main building blocks, or content elements, are the following:
  - Roles (who) – A Role defines a set of related skills, competencies and responsibilities.
  - Work Products (what) – A Work Product represents something resulting from a task, including all the documents and models produced while working through the process.
  - Tasks (how) – A Task describes a unit of work assigned to a Role that provides a meaningful result.
Information system development

- Information system development Methodologies
  - RUP (Rational Unified Process)
  - Within each iteration, the tasks are categorized into nine disciplines:
    - Six "engineering disciplines" Business Modeling
      - Requirements
      - Analysis and Design
      - Implementation
      - Test
      - Deployment
    - Three supporting disciplines
      - Configuration and Change Management
      - Project Management
      - Environment
Information system development

- Information system development Methodologies
  - Spiral model
    - The spiral model combines elements of both design and prototyping-in-stage.
    - Spiral model combines advantages of top-down and bottom-up concepts.
Information system development

- Information system development Methodologies
  - Spiral model

- The spiral model combines the idea of iterative development with the systematic, controlled aspects of the waterfall model.

- The spiral model is based on continuous refinement of key products for requirements definition and analysis, system and software design, and implementation (the code).

- Documents are produced when they are required, and the content reflects the information necessary at that point in the process.

- Spiral model forces early user involvement in the system development effort.
Information system development

- Information system development Methodologies
  - Agile software development
    - Agile software development is a group of software development methods based on iterative and incremental development, where requirements and solutions evolve through collaboration between self-organizing, cross-functional teams.
    - It promotes adaptive planning, evolutionary development and delivery, a time-boxed iterative approach.

- Information system development Methodologies
  - Agile software development methods
    - Agile Unified Process (AUP)
    - Crystal Clear
    - Crystal Methods
    - Dynamic Systems Development Method (DSDM)
    - Extreme Programming (XP)
    - Feature Driven Development (FDD)
    - Lean software development
Information system development

- Information system development Methodologies
  - Rapid Application development
    - Rapid application development (RAD) is a software development methodology that uses minimal planning in favor of rapid prototyping.

- The lack of extensive pre-planning generally allows software to be written much faster, and makes it easier to change requirements.

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Information system development

- Information system development Methodologies
  - Rapid Application development
    - Requirements Planning phase

  - User design phase

  - Construction phase

  - Cutover phase